

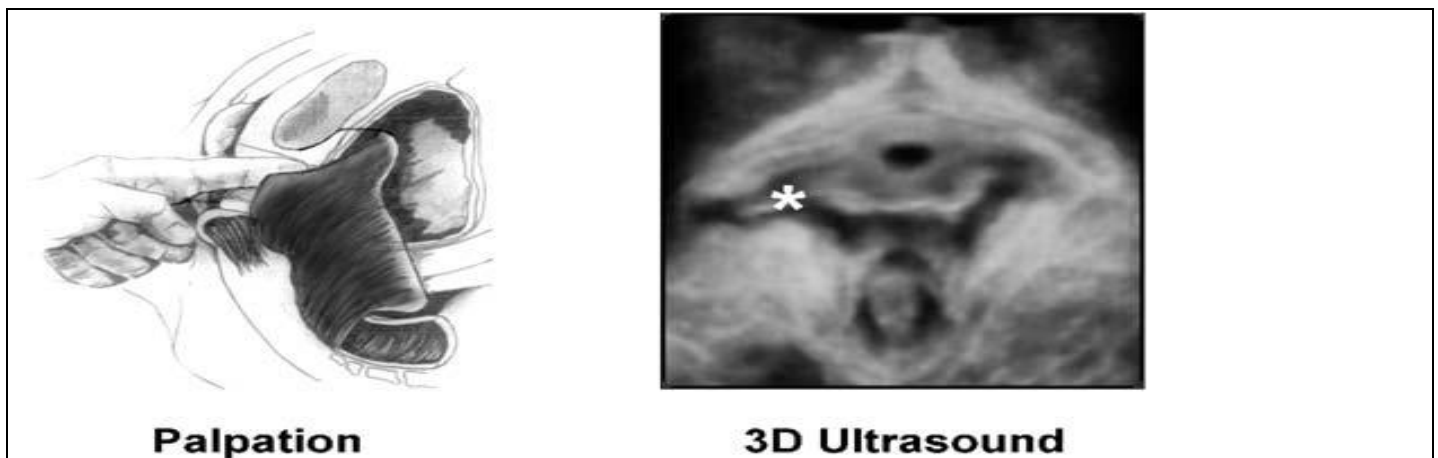
WOMEN WHO CANNOT CONTRACT THEIR PELVIC FLOOR MUSCLES- AVULSION OR DENERVATION? THE PELVIC FLOOR NEUROANATOMY STUDY

Hypothesis / aims of study

Pelvic floor muscle training is the first line treatment for stress urinary incontinence. However 12-15 % of patients who present to our service with symptoms of urinary incontinence are unable to contract their pelvic floor muscles (PFM) at the first visit. The reasons why are not fully understood. The aim of our study was to examine the possible aetiology behind this. We hypothesized that women with absent pelvic floor squeeze may have had a pelvic floor injury to either the PFM or the nerves supplying them. We investigated such women looking directly for levator trauma using 3 D translabial ultrasound and tested nerve function using concentric needle electromyography of the levator ani muscle.

Study design, materials and methods

The notes of all women who presented with a main complaint of stress urinary incontinence to our tertiary Urogynaecology unit were screened as to their ability to contract their pelvic floor muscles on examination by a gynaecologist. If after individual teaching of pelvic floor muscle exercises by a physiotherapist for at least 4 visits they were still unable to contract their muscles they were contacted by mail and invited to participate in this study. Patients were excluded if they had had previous pelvic floor surgery. 3D translabial ultrasound was carried out by a single observer using a GE Voluson 730 Expert system. Women were examined in lithotomy and levator trauma (avulsion) was diagnosed as present or absent using the criteria described by previous authors (1) (discontinuity between levator muscle and pelvic side wall and in unclear cases a levator-urethra gap measurement greater than 2.5cm). Bilateral concentric needle electromyography was conducted by a neurophysiologist and urogynaecology fellow. The levator muscle (pubococcygeous) was sampled transvaginally at 2 sites bilaterally. The resulting electromyographic tracing was subsequently examined for neuropathic/myopathic injury (spontaneous activity, motor unit morphology and interference patterns) of the muscles sampled (2). Substantial disruption of the EMG tracing was required to diagnose an "abnormal" tracing.



Results

287 women presented with a main complaint of stress incontinence to our unit during a 12-month recruitment period. 36 (12.5%) women initially were unable to contract their pelvic floor muscles and 15 (5.2%) women despite physiotherapy were still unable to contract their pelvic floor muscles. 6 women have completed both investigations to date with 7 more recruited and consented (projected sample size anticipated to be 15). Mean age was 45 (29-71), mean parity was 2.1 (2-3). All women had vaginal deliveries with 5/6 (84%) requiring suturing. All women had 4 or more visits to a pelvic floor physiotherapist to try to learn to contract their pelvic floor muscles. 2/6 (33%) of women had a bilateral avulsion injury of the levator muscle, with no unilateral injuries identified. Concentric needle electromyography of the levator ani muscle revealed no definite electrophysiological abnormality in any woman. Although there were minor abnormalities detected the degree of these did not meet diagnostic criteria. Specifically there was no evidence of spontaneous activity in any of the samples. A full interference pattern was achieved in 4/6 (66%) women, with nearly full in the other 2. Sampling of motor unit morphology showed normal results in 4 women and borderline abnormal in 2. These 2 women had normal levator anatomy.

Interpretation of results

We were pleased to find that 21 of 36 patients could be trained to contract their PFM despite being unable to do so at their first clinical visit. This alone has important implications for the use of electrical stimulation therapy. The complete inability of some women to achieve any PFM contraction is a difficult problem, which has previously not been thoroughly investigated. We were somewhat surprised to find that none of the patients had any clinically significant denervation and in fact avulsion injuries were more common. Thus these early findings suggest that there may be other factors contributing to a women's inability to contract her pelvic floor muscles.

Concluding message

With the advent of newer imaging techniques and greater knowledge and use of neurophysiology testing, we were able to show definite anatomic abnormalities in a proportion of women but the anticipated neurophysiological disturbances were not seen. Thus we cannot explain the entire pathophysiology in all "non-contracting" women: continuing research into this area is needed.

References

1. Ultrasound Obstet Gynecol 2008;32:941-945
2. Curr Opin Obstet Gynecol 2002;509-514

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<i>Is this a clinical trial?</i>	No
<i>What were the subjects in the study?</i>	HUMAN
<i>Was this study approved by an ethics committee?</i>	Yes
<i>Specify Name of Ethics Committee</i>	South Eastern Sydney and Illawarra Area Health Service Human Research Ethics Committee Southern Section . Approval number 07/73 Moore
<i>Was the Declaration of Helsinki followed?</i>	Yes
<i>Was informed consent obtained from the patients?</i>	Yes